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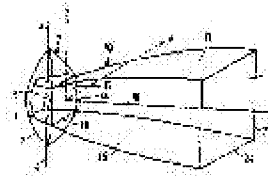
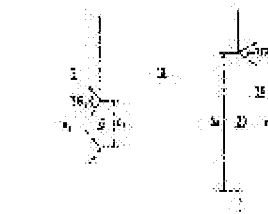
## (54) LIGHT BULB PROJECTING DEVICE

(57)Abstract:

**PURPOSE:** To project incident light from a light source to a rectangular modulator and a projection lens as uniform illumination light by forming an incident aperture and a projection aperture of a non-imaging reflector respectively in rectangles having almost parallel edge parts and satisfying specific relational equations.

**CONSTITUTION:** A converging optical system in the projecting device is provided with the non-imaging reflector 10 for converging light rays projected from a light source 2 through the incident aperture 12 having an incident angle  $2\theta_i$  in a large range and dimension  $D_i$  and uniformly illuminating the projection aperture 20 having an outgoing angle  $2\theta_o$  in a small range and large dimension  $D_o$ . The reflector 10 is constituted so as to have a composite parabolic reflector shape having two axes (x), (y) orthogonal to the optical axis 18 of the reflector 10 and satisfy relational equations I, II. Here,  $D_{ix}$  and  $D_{iy}$  are the dimension of the incident aperture 12,  $\theta_{ix}$  and  $\theta_{iy}$  are maximum incident angles,  $D_{ox}$  and  $D_{oy}$  are the dimension of the projection aperture 20,  $\theta_{ox}$  and  $\theta_{oy}$  are maximum out-going angles, and  $n_i$  and  $n_o$  are respective refractive indexes of the apertures 12, 20. The edge

$$\begin{aligned} \text{I. } n_i \sin \theta_{ix} &= n_o \sin \theta_{ox} \\ \text{II. } n_i \sin \theta_{iy} &= n_o \sin \theta_{oy} \end{aligned}$$



parts of both the apertures 12, 20 are formed in parallel.

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#### LEGAL STATUS

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